critical point of the whole reasoning is whether the observed temperatures at the three stations Roorkee, Dehra, and Mussooree, can be safely accepted as approximately representing those of the free atmosphere over the plains at the same levels, and this seems to us at least open to question. In the case of the lowest and highest stations, indeed, there is not much to object to. Roorkee is a fairly representative station of the northern part of the Gangetic plain, and the Mussooree Observatory, situated on the very crest of the ridge of the Himalaya, overlooking the plains, is probably as little affected by the local heating of the ground as any mountain observatory can be. But Dehra, which furnishes the really critical datum of Mr. Hill's reasoning, is on the plain of the *Dún*, a flat valley six or eight miles across, stretching between the Sivaliks and the foot of the Mussooree ridge, and it is by no means self-evident that the local temperature is not largely affected by causes which are quite inoperative in the free atmosphere at the same elevation over the plains.

In our opinion, then, Mr. Hill's conclusion that the storms of April 30 and May 1 were determined by a change in the vertical distribution of temperature, transferring the condition of instability from the lower to the higher atmospheric strata, is at least open to doubt. To a certain extent, indeed, it is supported by the evidence of other observatories in the North-West Himalaya, especially Chakrata, the situation of which is very similar to that of Mussooree; but the difference of their elevation (170 feet) is too small to allow of its having much weight in determining the point at issue.

The most noteworthy feature of the storm of April 30 was the fearful loss of life caused by it at Moradabad. Not less than 230 deaths were reported at this station alone, the vast majority of which were caused directly by the hail. The collector's report states that men caught in the open and without shelter were simply pounded to death. The spring is especially the season of native weddings, and "more than one marriage party was caught by the storm near the banks of the river and was annihilated." It is, however, suggested by Mr. Hill that many of the deaths may have been caused by cold. "Immediately before the storm the temperature had been very high, and many if not the majority of the deaths due to it may have been occasioned by the persons exposed to its fury being knocked down and temporarily packed in ice." At Moradabad the hailstones are stated to have been the size of plums—probably the *bér* plum, *Zizyphus jujuba*, the cultivated form of which is two or three times as large as a walnut.

In the storm of May 1, the hailstones at some places were larger, though the destruction was less. At Ghaziabad they are said to have been as large as cricket balls, and one was picked up at Delhi weighing 4½ ounces. At Tilhar they are reported to have been larger than goose eggs, and at a neighbouring place they averaged 3 inches in diameter. Their form is described as a flat oval.

SCIENTIFIC SERIALS.

Bulletin de l'Académie Royale de Belgique, November 1889.—On the existence of a gizzard, and on its structure, in the family of the Scolopendridæ, by M. Victor Willem. The presence of a gizzard in the lower organisms was first determined by M. F. Plateau in 1876. But the gizzard of insects was long supposed to be merely a triturating organ acting mechanically, without any physiological function. Continuing Plateau's researches, M. Willem now finds that the gizzard is not only present in several genera of the Scolopendrid family, but that it is a true digester. The structure is fully described, and illustrated by two plates, on which are figured the gizzards of *Scolopendra hispanica*, *S. cingulata*, *S. heros*, *Scolopocryptops*, *Cryptops punctatus*, and *C. hortensis*. In these last, the apparatus is most highly developed, being even more complicated than amongst the higher order of insects. No explanation is offered of this apparent anomaly.—Unexpected proof of diurnal nutation, and necessity of taking it into consideration in the reduction of observations, by M. F. Folie. The coefficient of diurnal nutation as already approximately determined at 0·01s. by the author's numerous researches, has recently been confirmed in a somewhat remarkable manner by the results of M. Kobold's observations of the Polar star with the meridian circle of Strassburg. The azimuthal errors of this instrument were found to present, not an annual, but a diurnal period, and Kobold's corrections are shown to be illusory, being due to his neglect of the element of diurnal nutation in the reduction of his observations. When this element is taken into account, the results harmonize with those previously arrived at by M. Folie.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, Dec. 19, 1889.—"On the Effects of Pressure on the Magnetization of Cobalt." By C. Chree, M.A., Fellow of King's College, Cambridge. Communicated by Prof. J. J. Thomson, F.R.S.

It has long been known, from the classic researches of Dr. Joule, that a rod of iron free from stress increases in length when magnetized in a comparatively weak field. When, however, the strength of the field is continually raised, it has been found by Mr. Shelford Bidwell that the rod ceases to increase in length, and then shortens, so that in a sufficiently strong field the length becomes less than it was originally. It has also been found by Villari, Sir W. Thomson, and others, that when a rod of iron is exposed to successive loadings and unloadings of a given weight in a magnetic field, there appears a corresponding cyclic change of magnetization. In this cyclic change the maximum magnetization occurs when the load is "on," or when the load is "off," according as the field is weaker or stronger than a certain critical field depending on the load, called by Sir W. Thomson the Villari critical field.

Cobalt has been found by Mr. Shelford Bidwell to shorten when magnetized in weak fields, but to lengthen in very strong fields. The field in which it ceases to shorten is very much higher than the field in which iron ceases to lengthen. Also in weak fields Sir W. Thomson has found the magnetization of a cobalt rod under cyclic applications of tension to be least when the tension is "on."

Now, Prof. J. J. Thomson has shown that on dynamical principles the effect of changes of magnetization on the length of a rod of magnetic metal, and the effect of changes in the length of the rod on the magnetization, must be fundamentally connected. In his "Applications of Dynamics to Physics and Chemistry," he has arrived at mathematical equations connecting the two phenomena, such that from a knowledge of the one set of phenomena the character of the other set can be deduced.

The conclusions derived from the theory are in the case of iron in accordance with the results of experiment, at least in their general character. In cobalt there is also an agreement between theory and experiment, so far as Sir W. Thomson's experiments go. In the absence of further experiments it would, however, be impossible to tell whether or not this agreement extended to the strong fields in which occurred the important phenomena observed by Mr. Shelford Bidwell. The application of Prof. J. J. Thomson's formulæ to Mr. Shelford Bidwell's results led him to the conclusion that under cyclic applications of pressure a cobalt rod should experience cyclic change of magnetization, and that the maximum magnetization should answer to pressure "on," or to pressure "off," according as the magnetic field was weaker or stronger than a critical field, corresponding to the Villari field in iron. It was for the purpose of determining whether such a critical field did actually exist that the present investigation was commenced at Prof. J. J. Thomson's suggestion.

Employing the magnetometric method, it was found that the agreement between theory and experiment was at least as satisfactory in cobalt as in iron. The application of pressure-cycles in a magnetic field led to a cyclic change of magnetization in a cobalt rod, in which the maximum magnetization occurred when pressure was "on," or when it was "off," according as the strength of the field was below or above 120 C.G.S. units. This accordingly was the Villari critical field foreshadowed by theory.

In weak fields the first pressure applied after the introduction of the cobalt rod into the magnetizing coil caused a large increase in the induced magnetization. As the strength of the field was raised, this change in the magnetization attained a maximum, then, diminishing, vanished in a field considerably stronger than the Villari field for the cyclic effect, and in all stronger fields consisted in a diminution of magnetization.

Both Villari and Prof. Ewing observed that, after the break of the magnetizing current, cyclic changes of tension produced eventually, in iron wires, cyclic changes of the residual magnetization. In these, the maximum magnetization answered, as in the induced magnetization in fields below the Villari point, to tension "on."

In the present investigation, the existence of a cyclic change in the residual magnetization of cobalt accompanying cyclic changes of pressure has been established, and the magnitude of the effect examined in a large number of fields, extending from 0 to 400 C.G.S. units. It was found that not only the magnitude, but the sign even, of the effect depended largely on the condition of the rod during the break of the current. When the rod was under pressure during the break, the residual magnetization in the cyclic state showed a maximum under pressure, whatever was the strength of the pre-existing field. When, however, the rod was free from pressure during the break of the current, it was only in the residual magnetization left after the weakest fields that the maximum answered to pressure "on." When the strength of the pre-existing field was raised, the effect passed through the value zero and changed sign.

"On the Extension and Flexure of Cylindrical and Spherical Thin Elastic Shells." By A. B. Basset, M.A., F.R.S.

The method which I have employed in dealing with problems relating to the equilibrium and motion of thin cylindrical and spherical elastic shells, is as follows:—

Taking the case of a cylindrical shell, let OADB be a small curvilinear rectangle described on the middle surface, of which the sides OA, BD are generators, and the sides AD, OB are circular sections. The resultant stresses per unit of length across the section AD are completely specified by the following five quantities, viz. (1) a tension, T_1; (2) a tangential shearing stress, M_2; (3) a normal shearing stress, N_2; (4) a flexural couple, G_2; (5) a torsional couple, H_1; and the stresses across BD may be derived by interchanging the suffixes 1 and 2. If, therefore, we resolve all the forces which act upon the element along OA, OB and the normal, and take moments about these lines, we shall obtain the six equations of motion in terms of these stresses.

The expression for the potential energy is next found, which differs from that obtained by Mr. Love (Phil. Trans., 1888), owing to the fact that he has omitted to take into account several terms involving the product of the extensions and the cube of the thickness.

The variational equation can now be written down, and if it be applied to a curvilinear rectangle bounded by two lines of curvature and worked out in the usual way, the line integral part will determine the values of the edge stresses T_1, T_2, . . . in terms of the displacements; and the surface integral part will determine the three equations of motion in terms of the displacements. These results furnish a test of the accuracy of the work, and also of the fundamental hypothesis upon which the theory is based (viz. *that if the surfaces of the shell are not subjected to any surface pressures or tangential stresses, the three stresses, R, S, T, are of the order of the square of the thickness*); for if we substitute the values of the edge stresses in the last three of our original equations, they ought to reduce to identities; whilst if we substitute these values in the first three, we ought to reproduce the equations of motion which we have obtained by means of the variational equation; and this is found to be the case.

The boundary conditions are obtained by Stokes's theorem, which enables us to prove that it is possible to apply a certain distribution of stress to the edge of a thin shell, without producing any alteration in the potential energy due to strain.

Geological Society, December 18, 1889.—W. T. Blanford, F.R.S., President, in the chair.—The following communications were read:—On the occurrence of the genus *Girvanella*, and remarks on Oolitic structure, by E. Wethered. The author referred to his previous work, wherein he had shown that *Girvanella* is not confined to Silurian rocks, and that as a rock-forming organism it is more important than was supposed, occurring in the Gloucestershire Pea-grit, and also in the Coralline Oolite of Weymouth. He now dealt more in detail with its occurrence (1) in the *Carboniferous Oolitic Limestone*; and (2) in the *Jurassic Oolites*. In the Carboniferous limestone of the Avon valley, Oolitic limestone occurs on four horizons, in three of which the Oolites rest on dolomite. In none of these three cases are there signs of *Girvanella*. From beds partly Oolitic, and not resting on dolomite, he has been able to determine two new species. The Oolite not associated with dolomite is less crystalline, and the original structure is better preserved. In referring to *G. pisolitica*, he discussed whether *Girvanella* is most allied to the *Challenger* Foraminifer, *Hyperammina vagans*, or to *Syringammina fragilissima*. Traces of the organism occur in the *Clypeus*-grit, but none are quoted from beds of the Great Oolite, nor from the Portland Oolite. The author had already shown that the pisolites in the Coralline Oolite of Weymouth were not concretions, but forms of *Girvanella*. Excluding these, he showed that the spherules are of four types, of which one is the ordinary Oolitic granule, while each of the others suggests the presence of *Girvanella*. The characters of the genus, as seen under the microscope were indicated, and four new species were described. The President remarked on the importance of investigating the question whether these appearances are organic or not. We should take warning from *Eozoon* as to possible differences of opinion in the interpretation of tubular structure, though these mystifying appearances seem more common in serpentine and chalcedony than in calcite. In the bodies depicted, the wall, the irregularity, and the manner in which the tubes curve round each other are in favour of their being organic. Prof. Rupert Jones thought that these forms were not due to mineral but to organic laws. Dr. Evans, while disclaiming any special knowledge of the subject, suggested that the appearances might be interpreted on the supposition of an organism boring into a comparatively hard substance. Dr. Hinde, who had seen most of the known species of *Girvanella*, spoke of the wide distribution of these organisms. Remarks were also offered by Dr. Hicks, Prof. Bonney, Prof. Judd, the Rev. H. H. Winwood, and the author.—On the relation of the Westleton Beds or "Pebbly Sands" of Suffolk to those of Norfolk, and on their extension inland, with some observations on the period of the final elevation and denudation of the Weald and of the Thames Valley, Part 2, by Prof. Joseph Prestwich, F.R.S.—The author having, in the first part of this paper (Proc. Geol. Soc., June 5, 1889), discussed the relationship of the Westleton Beds to the Crag series and to the Glacial deposits, proceeded in the present contribution to consider the extension of the Westleton Beds beyond the area of the Crag, and described their range inland through Suffolk, East, West, and South Essex, Middlesex, North and South Hertfordshire, South Buckinghamshire, and North and South Berkshire, noticing their relationship to the overlying Glacial beds, where these were developed, and the manner in which they reposed upon older deposits. He gave an account of the heights of the various exposures above Ordnance Datum, and mentioned the relative proportion of the different constituents in various sections, thus showing that in their southerly and westerly extension they differed both in composition and in mode of distribution from the Glacial deposits. Distinction was also made between the Westleton Beds and the Brentwood Beds. Attention was next directed to the occurrence of the Westleton series, south of the Thames, in Kent, Surrey, and Hampshire, and their possible extension into Somersetshire was inferred from the character of the deposits on Kingsdown and near Clevedon. In tracing the deposits from the east coast to the Berkshire Downs, the author noticed that at the former place the beds lay at sea-level, but ranging inland, they gradually rose to heights of from 500 to 600 feet; that in the first instance they underlay all the Glacial deposits, and in the second they rose high above them, and their seeming subordination to the Glacial series altogether disappeared; thus at Braintree, where the Westleton Beds were largely developed, they stood up through the Boulder-clay and gravel which wrapped round their base, whilst further west, where they became diminished to mere shingle-beds, they attained heights of from 350 to 400 feet, capping London-clay hills, where the Boulder-clay lay from 80 to 100 feet lower down the slopes, the difference of level between the two deposits becoming still greater in a westerly direction, until finally the Boulder-clay disappeared. The origin of the component pebbles of the beds was discussed, and their derivation traced (1) to the beds of Woolwich age in Kent, North France and Belgium, and possibly to some Diestian beds, (2) to the older rocks of the Ardennes, (3) to the Chalk and older drifts, and (4) to the Lower Greensand of Kent and Surrey, or in part to the Southern drift. The marine nature of the beds was inferred from the included fossils of the type-area, and the absence of these elsewhere accounted for by decalcification. The southward extension of the beds was shown to be limited by the anticlinal of the Ardennes and the Weald, and the scanty palæontological evidence of the nature of that land was noted, and the possible existence of the Scandinavian ice-sheet to the north was referred to in connection with the disappearance of the beds in that direction. From the uniform character of the Westleton shingles, the author maintained that they must originally have been formed on a comparatively level sea-floor, and that the inequalities in distribution had been produced by subsequent differential movement to the extent of 500 feet or more to the north and west above that experienced to the east and south, where the chronological succession remained unbroken, also that the inequalities below the level of the Westleton beds had been produced since the period of their deposition, as, for instance, the gorge of the Thames at Pangbourne and Goring, and most of the Preglacial valleys in the district; furthermore, evidence was adduced in favour of the formation of the escarpments of the Chalk and Oolites since Westleton times, whilst certain observations supplied data for estimation of the relative amounts of pre- and post-glacial denudation of the valleys. It was stated, in conclusion, that the time for the vast amount of denudation was so limited that it was not easy to realize that such limits could suffice, but the author did not see how the conclusions which he had arrived at could well be avoided. After the reading of this paper there was a discussion, in which the President, Mr. Topley, Prof. Hughes, and others took part.

Linnean Society, December 19, 1889.—Mr. J. G. Baker, F.R.S., Vice-President, in the chair.—Prof. P. M. Duncan made some supplementary remarks on a specimen of *Hyalonema Sieboldii*, which he had exhibited at a previous meeting.—Mr. W. Hatchett Jackson exhibited and gave an account of an electric centipede (*Geophilus electricus*), detailing the circumstances under which he had found it at Oxford, and the results of experiments which he had made with a view of determining the nature and properties of a luminous fluid secreted by it. This, he found, could be separated from the insect, and could be communicated by it to every portion of its integument. An interesting discussion followed, in which Mr. Briese, Mr. A. W. Bennett, Prof. Stewart, Mr. A. D. Michael, Dr. Collingwood, Mr. Christy, and Mr. J. E. Harting took part. The last-named speaker pointed out that the observations made by Mr. W. Hatchett Jackson on this centipede had been long ago anticipated by Dr. Macartney in an elaborate paper on luminous insects published in the Philosophical Transactions for 1810 (vol. c. p. 277).—A paper was then read by Mr. T. Johnson on *Dictyopteris*, in which he gave a detailed account of the life-history of this brown seaweed, with remarks on the systematic position of the *Dictyotaceæ*. Dr. Scott, Mr. George Murray, and Mr. A. W. Bennett criticized various portions of the paper, and acknowledged the important scientific bearing of the facts which had been brought out by Mr. Johnson's careful and minute researches.—In the absence of the author, Mr. W. P. Sladen detailed the more important portions of a paper by the Rev. John Gulick, on intensive segregation and divergent evolution in land Mollusca; a paper which might be regarded as a continuation and amplification of the views which the same author had expressed in a former paper published in the Society's Journal last year (vol xx., Zool., pp. 189-274).

PARIS.

Academy of Sciences, December 30, 1889.—M. Hermite in the chair.—List of the prizes awarded to successful competitors in the various branches of science during the year 1890:—*Geometry:* Prix Francœur, M. Maximilien Marie; Prix Poncelet, M. Édouard Goursat. *Mechanics:* Extraordinary Prize of 6000 francs, MM. Caspari, Clauzel, and Degouy, 2000 francs each; Prix Montyon, M. Gustave Eiffel; Prix Plumey, M. Widmann. *Astronomy:* Prix Lalande, M. Gonnessiat; Prix Valz, M. Charlois; Prix Janssen, Mr. Norman Lockyer. *Physics:* Prix L. La Caze, M. Hertz. *Statistics:* Prix Montyon, two prizes awarded—one to the late M. Petitdidier and M. Lallemand, the other to Dr. F. Ledé. *Chemistry:* Prix Jecker, MM. A. Combes, R. Engel, and A. Verneuil; Prix L. La Caze, M. F. M. Raoult. *Geology:* Prix Delesse, M. Michel Lévy. *Botany:* Prix Desmazières, M. E. Bréal; Prix Montagne, MM. Ch. Richon and Ern. Roze; Prix Thore, MM. de Bosredon and de Ferry de la Bellone. *Agriculture:* Prix Vaillant, M. Ed. Prillieux. *Anatomy and Zoology:* Grand Prize of the Medical Sciences, MM. L. Félix Henneguy and Louis Roule. *Medicine and Surgery:* Prix Montyon, three prizes were awarded to M. A. Charrin, to MM. A. Kelsch and P. L. Kiener, and to M. Basile Danilewsky, respectively; Prix Bréant, M. A. Laveran; Prix Barbier, MM. M. E. Duval, Ed. Heckel, and F. Schlagdenhauffen; Prix Godard, M. A. Le Dentu; Prix Lallemand, M. Paul Loye; Prix Bellion, MM. F. Lagrange, and Laborde and Magnan; Prix Mège, Dr. A. Auvard. *Physiology:* Prix Montyon, M. A. d'Arsonval; Prix L. La Caze, M. François Franck; Prix Pourat, Dr. Johannes Gad and Dr. J. F. Heymans; Prix Martin-Damourette, M. J. V. Laborde. *Physical Geography:* Prix Gay, M. Drake del Castillo. *General Prizes:* Prix Montyon (Unhealthy Industries), honourable mention of Dr. Maxime Randon; Prix Trémont, M. Jules Morin; Prix Gegner (Physiology), M. H. Toussaint; Prix Petit d'Ormoy (Natural Sciences), M. Jean Henri Fabre; Prix Petit d'Ormoy (Mathematical Sciences), M. Paul Appell; Prix Leconte (Chemical Explosives), M. Paul Vieille; Prix Laplace, two prizes, *ex æquo*, to MM. E. A. A. Verlant and E. Ch. E. Herscher. —The following prizes were proposed for the year 1890:—Grand Prize of the Mathemathical Sciences: To perfect in any important point the theory of differential equations of the first order and of the first degree. Prix Bordin: To study the surfaces whose linear element may be reduced to the form

$$ds^2 = [f(u) - \phi(v)](du^2 + dv^2).$$

Prix Francœur: Inventions or works tending to the progress of pure and applied mathematics. Prix Poncelet: The author of any work tending most to further the progress of pure and applied mathematics. Extraordinary Prize of 6000 francs: Any improvements tending to increase the efficiency of the French naval forces. Prix Montyon: Mechanics. Prix Plumey: Improvement of steam-engines or any other invention contributing most to the progress of steam navigation. Prix Lalande: Astronomy. Prix Damoiseau: To perfect the theory of the long periodical irregularities in the movement of the moon caused by the planets. Prix Valz: Astronomy. Prix Janssen: Physical Astronomy. Prix Montyon: Statistics. Prix Jecker: Organic chemistry. Prix Fontannes: The author of the best work on palæontology. Prix Vaillant: Researches on the agencies that have caused the foldings in the terrestrial crust—part played by horizontal displacements. Prix Gay: Orographic study of any mountain system by new and rapid processes. Prix Barbier: Any valuable discovery in the surgical, medical, or pharmaceutical sciences, and in therapeutic botany. Prix Desmazières: The best work on the whole or any part of the Cryptogamic flora. Prix Montagne: The authors of important works on the anatomy, physiology, development, or description of the lower Crytogamic plants. Prix Thore: Works on the cellular Cryptogams of Europe, and on the habits or anatomy of any species of European insect, alternately. Prix Bordin: Comparative study of the auditory nerve in mammals and birds. Prix Savigny: For young zoological travellers. Prix Serres: On general embryology applied as far as possible to physiology and medicine. Prix Dusgate: The best work on the diagnosis of death, and on the means of preventing premature burials. Prix Montyon: Medicine and surgery. Prix Bréant: The discovery of a certain cure for Asiatic cholera. Prix Godard: On the anatomy, physiology, and pathology of genito-urinary organs. Prix Lallemand: Researches on the nervous system in the widest sense of the term. Prix Bellion: Works or discoveries serviceable to the health of man or to the improvement of the human species. Prix Mège: The author of a continuation and completion of Dr. Mège's essay on the causes that have retarded or favoured the advancement of medicine. Prix Montyon: Experimental physiology. Prix Pourat: On the properties and functions of the nervous cells attached to the organs of sense or to any one of them. Prix Delalande-Guérineau: For the French traveller or naturalist who shall have rendered the greatest service to France or to science. Prix Jérome Ponti: The author of any scientific work the continuation or development of which may be deemed valuable to science. Prix Montyon: Unhealthy industries. Prix Trémont: For any naturalist, artist, or mechanic needing help in carrying out any project useful or glorious for France. Prix Gegner: In aid of any *savant* distinguished by solid work done towards the advancement of the positive sciences. Prix Laplace: For the best student leaving the École Polytechnique.

BERLIN.

Physical Society, December 20, 1889.—Prof. von Helmholtz, President, in the chair.—Dr. Assmann demonstrated his aspiration thermometers and psychrometers after having first explained the theory and construction of the latter (see NATURE, vol. xxxvii. p. 215, and vol. xl. p. 660). He first dipped one o the thermometers into warm water at 45° C., in such a way that its external metallic envelopment was in contact with the water and took on the temperature of the latter, while at the same time aspiration could proceed undisturbed. When the clock-work was not set in motion and the turbine in the upper part of the instrument was at rest, the thermometer indicated a temperature of 35° C.; but as soon as aspiration was started by setting the clock-work in motion, the temperature recorded fell to 22°·5 C., being now identical with that indicated by a second thermometer not immersed in water. In the next place, a series of experiments was made in order to determine the rate of flow of the air through the thermometer. To effect this the thermometer was attached by an air-tight joint to the upper end of a glass cylinder whose capacity was 5 litres, whose interior was moistened with soapy water, and whose lower end was closed with a soap-film. On setting the instrument in work the time required for the aspiration of 5 litres of air was measured by the time the soap-film occupied in ascending from the lower to the upper end of the cylinder. The speaker showed that when the turbine was in motion the rate of flow of the aspired air was about 2·5 m. per second; when in addition to the turbine an external injector was used, the velocity rose to rather more than 3 m.; when the injector alone was used the velocity was similarly 3 m. The bellows which he had used in his earlier instruments gave a very variable and much slower current of air. Finally, he demonstrated the action of the instrument when employed as a psychrometer. By surrounding the thermometer with gauze and moistening the latter the instrument recorded a temperature of 18° C., while at the same time a similar non-moistened thermometer recorded 21° C. An ordinary psychrometer which was placed in close proximity to the other indicated 21° C. with the dry-bulb, and 16° C. with the wet. The President pointed out that when determining temperatures with an aspiration thermometer the rarefaction of the air must lead to a slight fall of temperature, which is, however, partly compensated for by the friction of the air. Both these factors can be calculated from the known rate of flow of the air.

In the report of the Berlin Physical Society, NATURE, January 2, p. 215, in the fourth line from the bottom, for "Society" read "Institute."

DIARY OF SOCIETIES.

LONDON.

THURSDAY, JANUARY 9.

ROYAL SOCIETY, at 4.30.—New Experiments on the Question of the Fixation of Free Nitrogen (Preliminary Notice): Sir J. B. Lawes, Bart., F.R.S., and Prof. Gilbert, F.R.S.—On Electric Discharge between Electrodes at Different Temperatures in Air and in High Vacua: Prof. J. A. Fleming.—A Milk-dentition in Orycteropus: Oldfield Thomas.

MATHEMATICAL SOCIETY, at 8.—On the Deformation of an Elastic Shell: Prof. H. Lamb, F.R.S.—On the Relation between the Logical Theory of Classes and the Geometrical Theory of Points: A. B. Kempe, F.R.S.—On the Correlation of Two Spaces, each of Three Dimensions: Dr. Hirst, F.R.S.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.

ROYAL INSTITUTION, at 3.—Electricity (adapted to a Juvenile Auditory): Prof. A. W. Rücker, F.R.S.

FRIDAY, JANUARY 10.

ROYAL ASTRONOMICAL SOCIETY, at 8.

INSTITUTION OF CIVIL ENGINEERS, at 7.30.—The Irrigation Works on the Cauvery Delta: Alfred Chatterton.

SATURDAY, JANUARY 11.

ROYAL BOTANIC SOCIETY, at 3.45.

ESSEX FIELD CLUB, at 7.—The Inter-Relations of the Field Naturalist's Knowledge: Prof. J. Logan Lobley.

SUNDAY, JANUARY 12.

SUNDAY LECTURE SOCIETY, at 4.—Heroes of British India; the Men who Conquered, Ruled, and Saved it: Willmott Dixon.

TUESDAY, JANUARY 14.

ZOOLOGICAL SOCIETY, at 8.30.—On a New Species of Otter from the Lower Pliocene of Eppelsheim: R. Lydekker.—A Complete List of the Sphinges and Bombyces known to occur on the Nilgiri Hills of Southern India, with Descriptions of New Species: G. F. Hampson.—On some Cranial and Dental Characters of the Domestic Dog: Prof. Bertram C. A. Windle and John Humphreys.—Fourth Contribution to the Herpetology of the Solomon Islands: G. A. Boulenger.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Recent Dock Extensions at Liverpool: George Fosbery Lyster.

WEDNESDAY, JANUARY 15.

SOCIETY OF ARTS, at 8.

ROYAL METEOROLOGICAL SOCIETY, at 7.15—Annual General Meeting.—Report of the Council.—Election of Officers and Council.—Atmospheric Dust (illustrated by Lantern Slides): Dr. W. Marcet, F.R.S., President.

ENTOMOLOGICAL SOCIETY, at 7.—Annual Meeting.—Election of the Council and Officers for 1890.—Address by the Right Hon. Lord Walsingham, F.R.S., President.

UNIVERSITY COLLEGE CHEMICAL AND PHYSICAL SOCIETY, at 4.30.—The Magnetization of Iron and Nickel: J. J. Stewart.

THURSDAY, JANUARY 16.

ROYAL SOCIETY, at 4.30.

LINNEAN SOCIETY, at 8.—Life-History of a Remarkable Uredine on Jasminum grandiflora: A. Barclay.—Certain Protective Provisions in some Larval British Teleosteans: E. Prince.

FRIDAY, JANUARY 17.

SOCIETY OF ARTS, at 8.

PHYSICAL SOCIETY, at 5.—On a Carbon Deposit in a Blake Telephone Transmitter: F. B. Hawes.—On Electric Splashes: Prof. S. P. Thompson.—On Galvanometers: Prof. W. E. Ayrton, F.R.S., T. Mather, and W. E. Sumpner.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

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